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Life Sciences Mass Spectrometry

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Untargeted 2DxLC-Mass Spectrometry using SWATH-DIA-Based Workflow for the Characterization of Lipid Profiles in Plasma Samples

Overview

- Fully automated robotic sample preparation with hyphenated dual LC-SWATH/MS analysis for lipids.
- SWATH/MS acquisition to record all the product ions originated from specific precursor ion windows in order to measure lipids
- Annotation and characterization of PC, LPC and PC O-lipids in human plasma, using CID (ESI-) SWATH-MS and EAD (ESI+) DDA-MS.

Introduction

The use of lipidomic analyses based on LC-mass spectrometry has become widespread due to its sensitivity and specificity which provides a broader picture of lipid profiles in biofluids. It also contributes to understand the role of lipids in biological processes and complement other "-omics" data. Special attention has also been paid to lipid profile alterations to establish biomarkers for the diagnosis and prognosis of various diseases. In this work, we combined an automated sample extraction and a two-dimensional liquid chromatography (2DxLC) system with HILIC-based class separation followed by an orthogonal reverse-phase chromatography with an untargeted SWATH-DIA workflow to accurately annotate phosphatidylcholines (PC), lysophosphatidylcholine (LPC) and etherphosphatidylcholines (PC O-) in human plasma samples.

Instrumentation





University of Geneva

References

- Raetz, M., Duchoslav, E., Bonner, R. *et al.* Hybrid SWATH/MS and HR-SRM/MS acquisition for phospholipidomics using QUAL/QUANT data processing. Anal Bioanal Chem 411, 5681-5690 (2019). https://doi.org/10.1007/s00216-019-01946-4
- Fractions collection Injector Online dilution Waste



Figure 2. analyze each fraction.

The authors declare no competing financial interest.



EAD (ESI+) acquisition		CID (ESI-) acquisition	
Parameter	Value	Parameter	Value
CUR	35	CUR	35
TEM	550	TEM	500
DP	50	DP	-80
GS1	55	GS1	30
GS2	60	GS2	35
KE	12 eV	CE	-40 ± 30 eV

This approach will also be used to investigate other lipid classes and its quantitative performance will be evaluated using the SRM1950 reference plasma

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